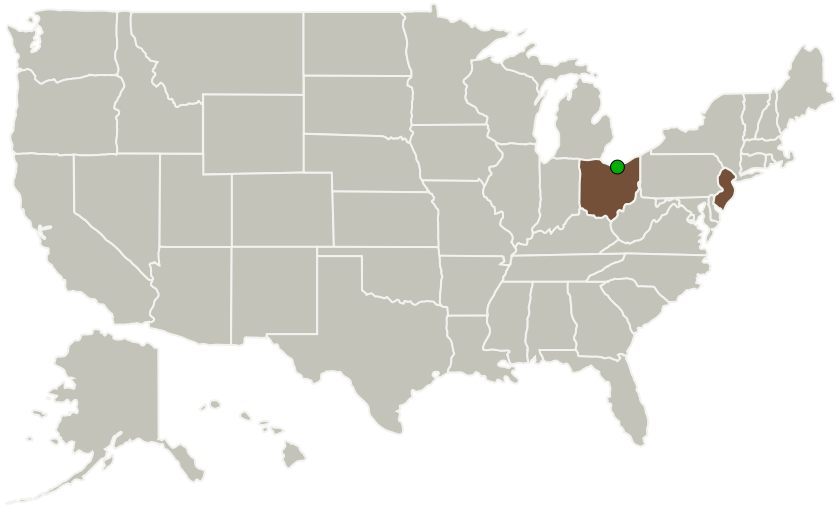
Fault Tolerant Software-Defined Radio on Manycore, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Mobile communications systems require programmable embedded platforms that can handle computationally demanding signal processing codes without the burden of high power consumption. As hardware performance improves, technology trends have shifted functionality from the gate level up to software, as demonstrated by the emergence of software defined radio. Traditionally, these platforms rely on FPGAs and DSPs, which are costly to program. Application demands for radiation mitigation and fault tolerance exacerbate programmability issues. Maxentric has been developing manycore-based software defined radio (SDR) technologies in an effort to innovate in this market. In this proposal, we describe a radiation-hardened software defined radio system called Resilient. In contrast to current software defined radio systems, Resilient employs a multi-core processor, Maestro. Using Maestro for SDR will enable sophisticated software-based fault tolerance approaches. Moreover, Maestro is based on a general purpose processing architecture that is significantly cheaper and easier to program, debug, and verify than FPGAs.

Primary U.S. Work Locations and Key Partners



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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
MaXentric Technologies, LLC	Lead Organization	Industry	Fort Lee, New Jersey
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
New Jersey	Ohio

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139963)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MaXentric Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

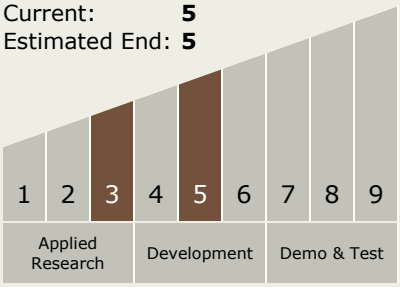
Carlos Torrez

Principal Investigator:

Scott Ricketts

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.4 Flight and Ground Systems

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System